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- Home
- About
- Disclaimer
- Navy Medicine News
- Navy Medicine WebSite
-

Written on DECEMBER 23, 2014 AT 6:00 AM by SVANDERWERFF

A Navy Microbiologist on the Ebola Front, Pt. I

Filed under [HEATH](#) [HUMANITARIAN ASSISTANCE AND DISASTER RELIEF](#) [MILITARY MEDICINE](#) (NO COMMENTS)

By Cmdr. Guillermo Pimentel, MSC, Naval Medical Research Center



The Navy is the only service that has mobile laboratory's that can deploy quickly to detect infectious agents, by commercial or military air.

Editor's Note. On September 28, 2014, Navy Microbiologist Cmdr. Guillermo Pimentel, MSC, and advanced laboratory technician HMC Jerrold Diederich travelled to the front lines of the Ebola outbreak in Liberia where they established two mobile laboratories for detecting the virus. The importance of these labs in Montserrado and Bong Counties cannot be understated. For many hundreds of men, women and children the Navy mobile labs have been the difference between life and death. Within four hours, lab personnel can determine if blood samples contains Ebola, ultimately ensuring that patients receive immediate medical attention. The Office of Medical History had the great pleasure of speaking with Cmdr. Pimentel as part of their oral history project. The following narrative is an excerpt.

When Ebola broke out the [CDC](#) was already on the ground in West Africa and the [U.S. Army Medical Research Institute of Infectious Diseases\(USAMRIID\)](#) was researching Lassa Fever in Sierra Leone [1]When Liberia's outbreak went out of control they set up operations at the [Liberian Institute](#) for Biomedical Research.


Some are surprised to learn that the Navy is the only service that has mobile laboratory's that can deploy quickly to detect infectious disease agents, by commercial or military air. We're

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January 2015 (5)

December 2014 (17)

November 2014 (11)

October 2014 (15)

the only team in the DoD that can deploy a full detection laboratory globally within 24 hours. At BDRD[2] we've been doing this for 12 to 13 years. Our labs deployed when we invaded Iraq, and to New York City after September 11. My teams train thru the year in multiple scenarios, and multiple environments.



Our labs deployed when we invaded Iraq, and to New York City after September 11.

In late August, CDC, DTRA-CBEP[3] and other DoD personnel visited [NMRC](#) to see our mobile labs, saying our labs were what they needed. At the time the international community was vocal bout how they thought the U.S. needed to play a bigger role.

At first we planned on leaving Sept. 8, but were unable to depart until the 25th, the reason being, because the DoD was now involved [AFRICOM](#)[4] had to submit a Request For Forces (RFF) and then be approved by the Joint Chiefs of Staff, which made the WHO very unhappy.

In the meantime, Liberia's Ebola crisis was out of control. They need our labs. Thank God the European Union was able to send an Italian laboratory to Lofa County[5], to provide much needed assistance.

Late Friday afternoon, Sept. 19 we got our RFF document. My chief[6] and I boarded a plane the following Monday with a goal of exploring the sites and assess prospective homes for my mobile labs.



Lt. Cmdr. Benjamin Espinosa, Naval Medical Research Center, dicusses lab operations with Col. Sazzad, commander of the Bangladesh contingent of the United Nations military forces in Liberia.

September 2014 (20)
August 2014 (14)
July 2014 (13)
June 2014 (8)
May 2014 (11)
April 2014 (9)
March 2014 (14)
February 2014 (7)
January 2014 (7)
December 2013 (7)
November 2013 (12)
October 2013 (7)
September 2013 (14)
August 2013 (13)
July 2013 (11)
June 2013 (22)
May 2013 (15)
April 2013 (14)
March 2013 (14)
February 2013 (14)
January 2013 (12)
December 2012 (11)
November 2012 (11)
October 2012 (7)
September 2012 (9)
August 2012 (12)
July 2012 (13)
June 2012 (17)
May 2012 (22)
April 2012 (14)
March 2012 (13)
February 2012 (14)
January 2012 (13)
December 2011 (13)
November 2011 (20)
October 2011 (22)
September 2011 (12)
August 2011 (16)
July 2011 (10)

The first thing I noticed when I arrived in Monrovia was that no one shook hands. There was no body contact. If you greeted somebody you put your hands to your heart or you touched elbows. It was my first time to this very poor country and obvious years of civil war had taken its toll.[7] My most dreadful experience was driving from the airport to the hotel, there was no power, and no power grid; everything was based on electric generators. Most shocking was seeing containers of bleach in front of buildings for washing hands. Before going into a building you must wash your hands in the bleach solution as a precaution. That first morning I didn't see any dead bodies; there wasn't a feeling the world was coming to an end, and no zombies were walking the streets. It seemed like business as usual, people going about their affairs as they normally would.

In September with the assistance of [WHO](#), CDC, MSF and NGOS, the government had a better grasp of the crisis, and had been working a strategy for implementing control. By then the bad things seen on Youtube and CNN were gone. Yes, there was an outbreak, but the government had done a good job with a huge educational Ebola campaign. Signs everywhere said "Ebola is real". Songs playing on the radio informed people of the threat.



We got the RFF on the 19th and by the following week, we had boots on the ground, ready to receive the labs. Fourteen days to become operational was unheard of.

Some people thought the government was using Ebola as a way to control them; different tribes, different cultures, different villages had different beliefs. Their burial practices are very complex and involve touching of the body, washing,, kissing and such. Informing people of the dangers of these practices was a way to prevent transmission. Our first mission was to make sure our labs would be ready to be received at the chosen locations.

We attended a meeting hosted by the Minister of Health with all of the international partners, NGOs, etc. at the Ebola Response Center, I met the Ambassador,[8] General Rodriguez[9] and Major General Williams,[10], in charge of the operation unit at the time. When informed that our Navy's labs were under way they couldn't believe how we got the RFF on the 19th and by the following week, we had boots on the ground, ready to receive the labs. Fourteen days to become operational was unheard of. They couldn't believe how fast we moved.

[1]Lassa hemorrhagic fever (LHF) is an acute viral hemorrhagic fever caused by the Lassa virus and first described in 1969 in the town of Lassa, Nigeria.

[1]Biological Defense Research Directorate (BRD), Fort Detrick, MD

[1]DTRA-CBEP—Defense Threat Reduction Agency -*Cooperative Biological Engagement Program (CBEP)*.

[1] United States Africa Command (AFRICOM) is one of six of the U.S. Defense Department's geographic combatant commands and is responsible to the Secretary of Defense for military relations with African nations, the African Union, and African regional security organizations. A full-spectrum combatant command, U.S. AFRICOM is responsible for all U.S. Department of Defense operations, exercises, and security cooperation on the African continent, its island nations, and surrounding waters. AFRICOM began initial operations on Oct. 1, 2007, and officially became an independent command on Oct. 1, 2008. (source: www.africom.mil).

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← Next post

Previous post →

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Written on DECEMBER 24, 2014 AT 6:00 AM by SVANDERWERFF

A Navy Microbiologist on the Ebola Front, Pt. II

Filed under FLEET AND THE FLEET MARINE FORCE, FORCE HEALTH AND SAFETY, HUMANITARIAN ASSISTANCE AND DISASTER RELIEF

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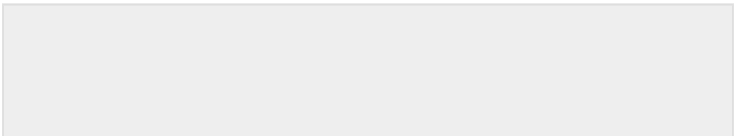
By Cmdr. Guillermo Pimentel, MSC, Naval Medical Research Center



On October 2nd my first lab became operational followed by my second lab on the 3rd.

Editor’s Note. On September 28, 2014, Navy Microbiologist Cmdr. Guillermo Pimentel, MSC, and advanced laboratory technician HMC Jerrold Diederich traveled to the front lines of the Ebola outbreak in Liberia where they established two mobile laboratories for detecting the virus. The importance of these labs in Montserrado and Bong Counties can’t be understated. For many hundreds of men, women and children they have been the difference between life and death. Within four hours, lab personnel can determine if blood samples contains Ebola, ultimately ensuring that patients receive immediate medical attention. The following narrative is part II of an excerpt.

On October 2nd my first lab[1] became operational followed by my second lab[2] on the 3rd. The impact was tremendous. Before our arrival specimens were taking up to six days to get results back. Ebola is a disease that is highly contagious. The signs and symptoms are very similar to Malaria, Influenza, food-borne poisoning, basic diarrhea, and Lassa Fever.



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January 2015 (5)

December 2014 (17)

November 2014 (11)

October 2014 (15)



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At the mobile laboratories our mission is strictly detection the virus on clinical samples. Because the signs and symptoms mimic a lot of other infectious diseases, if a person has a fever, diarrhea or vomiting they are immediately admitted to the Ebola Treatment Unit (ETU) for medical attention. That's because the healthcare system has completely collapsed and hospitals are shut down. Clinicians weren't seeing patients because they don't know how to handle all of the highly contagious patients.

People with malaria or food poisoning go to ETU's and wait alongside people suspected of having Ebola. Suspected cases wait in a room waiting their laboratory results. Unfortunately those with malaria or food poisoning must wait six days around people with wet cases of Ebola, and it's most likely they too will contract the virus, a double-whammy.



Once our guys became operational, we started providing results within four hours.

We set up our first laboratory in Montserrado County at the Island Clinic. WHO and CDC chose the location because a brand new ETU had been built, and managed by WHO, with Ugandan physicians. . The day we became operational they had more than 200 cases of Ebola, with a capacity for 150. It was a mess, but once our guys became operational, we started providing results within four hours. What it meant was if an individual came to the ETU with signs and symptoms of Ebola the laboratory could process the blood sample the

September 2014 (20)
August 2014 (14)
July 2014 (13)
June 2014 (8)
May 2014 (11)
April 2014 (9)
March 2014 (14)
February 2014 (7)
January 2014 (7)
December 2013 (7)
November 2013 (12)
October 2013 (7)
September 2013 (14)
August 2013 (13)
July 2013 (11)
June 2013 (22)
May 2013 (15)
April 2013 (14)
March 2013 (14)
February 2013 (14)
January 2013 (12)
December 2012 (11)
November 2012 (11)
October 2012 (7)
September 2012 (9)
August 2012 (12)
July 2012 (13)
June 2012 (17)
May 2012 (22)
April 2012 (14)
March 2012 (13)
February 2012 (14)
January 2012 (13)
December 2011 (13)
November 2011 (20)
October 2011 (22)
September 2011 (12)

same day and tell them within four hours whether they were positive or negative.

If negative, they can go home. Since the day we opened until November 12th) the ETU had 63 patients. Within a week of setting up it went from a little more than 200 cases in the confirmed ward to less than 150. After that it went below 100 and the lab has not gone over 100 cases since.

August 2011 (16)

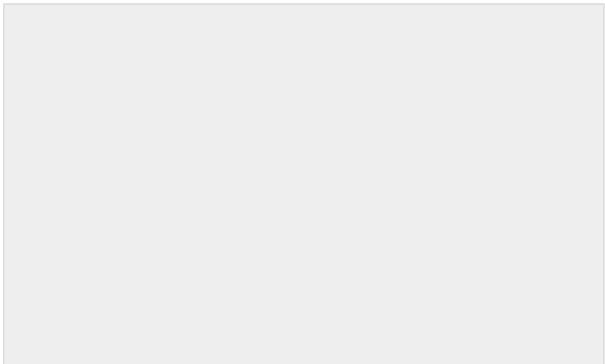
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Detection is a straightforward process, but very intense because you know that the one milliliter of blood in front of you can kill you if you are not on top of your game.

Detection is a straightforward process, but very intense because you know that the one milliliter of blood in front of you can kill you if you are not on top of your game. The most intense moment is handling the blood sample to kill the virus (inactivation). You have to know what you are doing. Because we are working in portable glove boxes with “heavy” personal protective equipment it gets tedious and uncomfortable.

Detection Ebola starts when the patient has active signs and symptoms, fever, vomiting, and diarrhea. It’s when the virus becomes active and reproduces in the human body. Hence, we can detect it through PCR.[3] The day a person is exposed to Ebola to the time they start showing active symptoms can take two -21 days. However, if you were “heavily” exposed to vomit and diarrhea etc., it’s very likely of seeing symptoms within three days, within 72 hours detection through PCR via molecular diagnostics. You take a blood sample, inactivate the virus and continue extracting the RNA[4], set up your PCR reaction and analyze the data.





It's very important to understand that we don't go to the ETUs, we don't draw blood, and don't interact with most of the population.

It's very important to understand that we don't go to the ETUs, we don't draw blood, and don't interact with most of the population. The life of the microbiologist/biochemist and technician on the Ebola front is: going from the hotel to the laboratory and from the laboratory to the hotel and that's it. That's how it is over there—saving lives, and saving families. These individuals get the specimens and develop a close relationship with ETU staff.

Each laboratory is equipped with the same equipment. They have three PCR instruments; with one for back-up. We are highly mobile. Our equipment can fit in six-seven Pelican cases. [5] .For this mission we went extremely heavy with supplies for 90 days of continuous operations. When both labs deployed each weighed almost 7,500 pounds.

I will never forget the day we got our first samples.. A PhD with a post-doc from Harvard, extremely bright guy, was the first to present the samples. We received 16 patients, four of them were little kids, and one was only 11 months old. The PCR result showed an extremely hot sample (aprx tenth to the ninth particles of Ebola per millimeter of blood).



We are highly mobile. Our equipment can fit in six-seven Pelican cases.

My laboratory personnel know the job that they are doing and they all want to stay. Frankly, I'm having a hard time bringing these kids back. My guys don't want to come back because they see the need being there. Let me put it this way, Iraq and Afghanistan was the war for trauma surgeons. This outbreak is the time for microbiologists and advanced laboratory technicians to shine.

Right now we are in a hotspot; we have media coverage and everybody knows about NMRC's mobile labs. I bet you two years from now nobody will care. Sadly, we are going to go back to our daily lives doing our daily research and I can't help but think all of our work saving lives will eventually be forgotten.

- [1] Island Clinic (Western Liberia)
- [2] Cuttington University, Bong County (Eastern Liberia).
- [3]PCR (polymerase chain reaction) is a technique for amplifying DNA sequences.
- [4]RNA: ribonucleic acid
- [5] High performance, watertight, and almost indestructible cases manufactured by the Pelican Company.
- [5] Lofa County is located in Northern Liberia.
- [6]HMC Jerrold Diederich, Command Chief, NMRC, Silver Spring, MD
- [7 In the last twenty five years Liberia has undergone two civil wars (1989-1997 and 1999-2003).
- [8] Ambassador Deborah R. Malac has served in Liberia since been 2012.
- [9] General David M. *Rodriguez, USA* serves as the Commander, United States Africa Command (AFRICOM).
- [10] Major General Darryl Williams, USA, commander U.S. Army in Africa.
- [11] Island Clinic (Western Liberia).
- [12] Cuttington University, Bong County (Eastern Liberia).
- [13]PCR (polymerase chain reaction) is a technique for amplifying DNA sequences.
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